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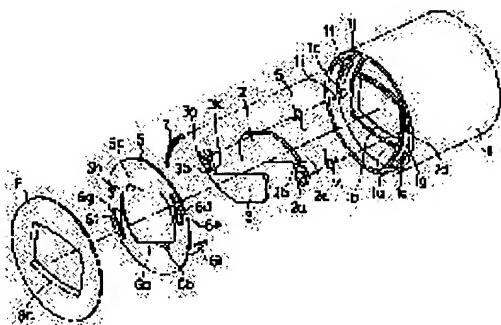
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(54) CAMERA

(57) Abstract:

PROBLEM TO BE SOLVED: To surely execute opening/closing operations with a simple constitution and to attain miniaturization by providing an opening/closing means retreated from a light unshielding region at a fully opening position and a barrier driving means for moving a pair of barriers and the opening/closing means to a fully closing position and the fully opening position, in such a manner that a rotary member is rotated on an optical axis.

SOLUTION: A barrier cover 8 having an aperture 8a larger than a photographic aperture 1b is arranged in a front end part and the barriers 2 and 3, a barrier driving link 6 and springs 4, 5 and 7 are arranged between a front end plate 1a and the barrier cover 8. Then, a pair of the barriers 2 and 3 are arranged behind the barrier cover 8, tuned in a plane nearly perpendicular to an optical axial direction, to open/close the aperture 8a of the barrier cover 8 and driven by the barrier driving link 6. By such a constitution, the aperture 8a of the barrier cover 8 can be opened/closed without increasing the number of the barriers 2 and 3 and further, a camera can be constituted without making the entire length of a barrier device long.



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CLAIMS

[Claim(s)]

[Claim 1] The camera characterized by providing the following. Mirror cylinder part material with built-in photography optical system which has opening for photography. the aforementioned lens-barrel which has barrier opening -- barrier covering formed in the anterior part of a member Barrier of the couple which can move between the closed position which has a non-shading field and shades to the aforementioned barrier opening, and the open positions which evacuated from this barrier opening. An opening-and-closing means to shade the aforementioned non-shading field by the aforementioned closed position, and to evacuate from this non-shading field by the aforementioned open position, and barrier driving means which move the barrier and the aforementioned opening-and-closing means of the aforementioned couple to a closed position and an open position when a rotation member rotates focusing on an optical axis.

[Claim 2] Barrier equipment characterized by having attached the aforementioned barrier covering, the barrier of the aforementioned couple, the aforementioned opening-and-closing means, and the aforementioned barrier driving means to one, and unitizing them in a claim 1.

[Claim 3] claims 1 or 2 -- setting -- the aforementioned barrier driving means -- the aforementioned lens-barrel -- the camera characterized by having a connection means to rotate a rotation member according to movement of the direction of an optical axis of a member

[Claim 4] It is the camera which carries out the feature of the aforementioned opening-and-closing means being prepared in the rotation member of the aforementioned barrier driving means in a claim 3.

[Claim 5] It is the camera characterized by preparing the aforementioned opening-and-closing means in the member other than the rotation member of the aforementioned barrier driving means in a claim 3.

[Claim 6] It is the camera characterized by forming the aforementioned barrier opening in claims 1, 2, 3, 4, or 5 more greatly than the aforementioned opening for photography.

[Claim 7] The camera characterized by preparing the contact member which contacts along the barrier and the direction of an optical axis of the aforementioned couple in the rotation member of the aforementioned barrier driving means in claims 1, 2, 3, 4, 5, or 6.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the barrier equipment formed in the front face of a lens of a camera, in order to start a camera, especially to protect photography optical system.

[0002]

[Description of the Prior Art] With reference to drawing 16 and drawing 17, the barrier equipment of the conventional lens shutter camera is explained.

[0003] They are the important section front view showing the state where the barrier carried out the close by-pass bulb completely of drawing 16, and the important section front view showing the state where the barrier opened drawing 17 fully.

[0004] As shown in drawing 16, the barrier 102 and 103 of two sheets is arranged at the lens-barrel frame 101 which made the outer diameter small. If it is made the composition which closes opening 108a of the barrier covering 108 arranged by these barrier 102 and 103 at the front end section of the lens-barrel frame 101, as shown in drawing 17. If barrier 102 and 103 opens fully with a non-illustrated barrier drive ring. Since the points 102a and 103a shown with the slash of the barrier 102 and 103 which has covered the diagonal section of opening 108a of the barrier covering 108 protrude from the outer diameter of the lens-barrel frame 101, The outer diameter of the lens-barrel frame 101 is enlarged, and it was made for the points 102a and 103a of barrier 102 and 103 not to protrude conventionally.

[0005] However, since the outer diameter of the lens-barrel frame 101 became large, the miniaturization of a lens barrel was difficult. Then, the barrier equipment of the lens of JP,3-18519,U is proposed. The barrier equipment of the lens indicated by above-mentioned JP,3-18519,U is the barrier of four sheets which consists of the 1st barrier driven in a barrier drive ring, and the 2nd barrier which is interlocked with this 1st barrier and driven, and closes [are and] it made to open lens opening of a lens barrel.

[0006]

[Problem(s) to be Solved by the Invention] However, there were the following faults in the above-mentioned conventional barrier equipment.

[0007] About the barrier, although it can be made to evacuate to the outside of lens opening of a lens barrel at the time of barrier full open, without enlarging the outer diameter of a lens-barrel frame, since the number of sheets of the barrier increased from two sheets to four sheets, and the position could be shifted in the direction of board thickness and arranged in it, the overall length of barrier equipment becomes long. Moreover, while the composition of barrier equipment became complicated, the crevice between each part articles increased, a foreign matter tended to invade and there was risk of producing the accident of the barrier stopping opening and closing with the foreign matter which invaded.

[0008] The purpose of invention concerning this application is to offer the camera which can carry out an opening-and-closing operation certainly with easy composition, and can attain the miniaturization of a camera.

[0009]

[Means for Solving the Problem] The 1st composition which realizes the purpose of invention concerning this application a lens-barrel member with built-in photography optical system which has opening for photography, and the aforementioned lens-barrel which has barrier opening -- with barrier covering formed in the anterior part of a member The barrier of the couple which can move between the closed position which has a non-shading field and shades to the aforementioned barrier opening, and the open positions which evacuated from this barrier opening. An opening-and-closing means to shade the aforementioned non-shading field by the aforementioned closed position, and to evacuate from this non-shading field by the aforementioned open position. When a rotation member rotates focusing on an optical axis, it is in the camera characterized by having the barrier driving means which move the barrier and the aforementioned opening-and-closing means of the aforementioned couple to a closed position and an open position.

[0010] In the 1st above-mentioned composition, the camera characterized by having attached the aforementioned barrier covering, the barrier of the aforementioned couple, the aforementioned opening-and-closing means, and the aforementioned barrier driving means to one, and unitizing them has the 2nd composition which realizes the purpose of invention concerning this application.

[0011] each composition of the above [the 3rd composition which realizes the purpose of invention concerning this application] -- setting -- the aforementioned barrier driving means -- the aforementioned lens-barrel -- it is in the camera characterized by having a connection means to rotate a rotation member according to movement of the direction of an optical axis of a member

[0012] It is the camera which carries out the feature of the aforementioned opening-and-closing means being prepared in the rotation member of the aforementioned barrier driving means in the 3rd composition which described above the 4th composition which realizes the purpose of invention concerning this application.

[0013] The 5th composition which realizes the purpose of invention concerning this application has the aforementioned opening-and-closing means in the camera characterized by being prepared in the member other than the rotation member of the aforementioned barrier driving means in the 3rd above-mentioned composition.

[0014] The 6th composition which realizes the purpose of invention concerning this application has the aforementioned barrier opening in the camera characterized by being formed more greatly than the aforementioned opening for photography in each above-mentioned composition.

[0015] In each above-mentioned composition, the camera characterized by preparing the contact member which contacts along the barrier and the direction of an optical axis of the aforementioned couple in the rotation member of the aforementioned barrier driving means has the 7th composition which realizes the purpose of invention concerning this application.

[0016] According to the above-mentioned composition, if a lens-barrel member lets out, for example, the rotation member of barrier driving means will rotate, an opening-and-closing means by which the barrier of the couple which was shading barrier opening, and a part of non-shading sections were shaded will evacuate, and barrier opening will open fully. Therefore, opening of the aforementioned barrier covering can be opened and closed, without increasing the number of sheets of the barrier. Moreover, while being able to constitute without lengthening the overall length of barrier equipment, the miniaturization of a lens barrel can be attained.

[0017] Moreover, since the aforementioned opening-and-closing means is formed in the rotation member of driving means at one and a part of opening of the aforementioned barrier covering is opened and closed, opening of the aforementioned barrier covering can be opened and closed, without increasing the number of sheets of the barrier. Moreover, while being able to constitute without lengthening the overall length of barrier equipment, the miniaturization of a lens barrel can be attained.

[0018] Furthermore, since an opening-and-closing means is established and a part of opening of the aforementioned barrier covering is opened and closed, while being able to close opening of this barrier covering, without increasing the number of sheets of the barrier, the miniaturization (especially outer diameter) of a lens barrel can be attained.

[0019] Moreover, since the heights as a contact member were prepared, for example in the aforementioned opening-and-closing means, the swing and tilt in the middle of opening and closing of the barrier of the aforementioned couple, and when a close by-pass bulb completely is carried out, the barrier of a couple can be doubled without a level difference. Furthermore, since the crevice between the barrier of the aforementioned couple and the aforementioned opening-and-closing means can be narrowed, while the probability which invades [dust] decreases, even if dust etc. trespasses upon the crevice between the barrier of a couple, and the aforementioned heights, the dust which invaded is removed and the barrier and this opening-and-closing means of this couple do not have a possibility of causing trouble to operation of this barrier, in order to rotate mutually.

[0020]

[Embodiments of the Invention]

Drawing 9 shows the form of operation of the 1st of this invention from [form of the 1st operation] drawing 1.

[0021] The decomposition perspective diagram in which drawing 1 shows the composition of barrier equipment, the front view showing the state where the barrier carried out the close by-pass bulb completely of drawing 2, The important section perspective diagram in which drawing 3 shows the state where the B-B view cross section of drawing 2 carried out the A-A view cross section of drawing 2, and drawing 4, and the barrier carried out the close by-pass bulb completely of drawing 5, The perspective diagram showing the state where the C-C view cross section of drawing 6 opened fully the front view and drawing 7 which show the state where the barrier opened drawing 6 fully, and the barrier opened drawing 8 fully, and drawing 9 are the partial side elevations showing the drive method of the barrier drive ring as driving member.

[0022] It is the lens-barrel frame with which 1 is arranged possible [optical-axis directional movement] in drawing 9 from drawing 1, the lens maintenance cylinder 9 which has photography optical system is connected with the back inside this lens-barrel frame 1, and the lens maintenance cylinder 9 moves in the direction of an optical axis united with the lens-barrel frame 1, when the lens-barrel frame 1 moves in the direction of an optical axis.

[0023] Front end board 1a is formed in the position entered from the front end section of the lens-barrel frame 1 to back, and photography opening 1b to the photography optical system of the lens maintenance cylinder 9 is formed in the center of front end board 1a. the hole which follower arm 6i of the barrier drive ring 6 penetrates around photography opening 1b -- 1c being formed and with the shafts 1d and 1e which support barrier 2 and 3 possible [rotation] Shaft 1j which hangs the heights 1f and 1g which support the barrier drive ring 6 in the direction of an optical axis, the shafts 1h and 1i which hang the end of springs 4 and 5, and the end of a spring 7 is implanted in an optical axis and parallel.

[0024] The barrier covering 8 with bigger opening 8a than photography opening 1b is arranged at the front end section, and a spring 4, and 5 and 7 are arranged. [the barrier 2 and 3 later mentioned between front end board 1a and the barrier covering 8, the barrier drive ring 6, and]

[0025] The barrier 2 and 3 of a couple is arranged behind the barrier covering 8, and is driven with the barrier drive ring 6 which rotates in the flat surface which intersects perpendicularly with the direction of an optical axis mostly, opens and closes opening 8a of the barrier covering 8, and is mentioned later.

[0026] the hole with which the barrier 2 was formed in the end face section -- the hole with which fitting support of the rotation of 2a on 1d of shafts of the lens-barrel frame 1 was enabled, and the barrier 3 was similarly formed in the end face section -- fitting support of the rotation of 3a to shaft 1e of the lens-barrel frame 1 is enabled

[0027] the hole of a barrier 2 -- the cam by which shaft 2b driven with the barrier drive ring 6 was implanted in the near position of 2a, and shaft 2b was formed in the barrier drive ring 6 -- a hole -- it is arranged in 6e moreover, it arranges on 1d of shafts of the lens-barrel frame 1, and the same axle -- having -- a hole -- shaft 2c for hanging the end of the spring 4 which is carrying out rotation energization counterclockwise in drawing 2 the center [2a] (a barrier is energized in the direction of closing) is implanted, and the other end of a spring 4 is hung on 1h of shafts of the lens-barrel frame 1 namely, the barrier 2 -- a spring 4 -- shaft 2b -- a cam -- a hole -- you make 6d of cam sides formed in 6e contact, and are making it the barrier drive ring 6 interlocked with

[0028] the same -- the hole of the barrier 3 -- the cam by which shaft 3b driven with the barrier drive ring 6 was implanted in the near position of 3a, and shaft 3b was formed in the barrier drive ring 6 -- it is arranged in 6g of holes

[0029] moreover, it arranges on shaft 1e of the lens-barrel frame 1, and the same axle -- having -- a hole -- shaft 3c for hanging the end of the spring 5 which is carrying out rotation energization counterclockwise in drawing 2 the center [3a] (the barrier is energized in

the direction of closing) is implanted in the barrier 3, and the other end of a spring 5 is hung on shaft 1i of the lens-barrel frame 1 namely, the barrier 3 -- a spring 5 -- shaft 3b -- a cam -- you make 6f of cam sides formed in 6g of holes contact, and are making it the barrier drive ring 6 interlocked with

[0030] Fit into the inner circumference of the lens-barrel frame 1 possible [rotation] focusing on an optical axis, interlock and rotate to movement in the direction of an optical axis of the lens-barrel frame 1, and the barrier drive ring 6 makes the barrier 2 and the barrier 3 drive, is arranged ahead of barrier 2 and 3, and is supported by the heights 1f and 1g of the lens-barrel frame 1.

[0031] As shown in the barrier drive ring 6 at drawing 2, drawing 4, and drawing 5, the opening-and-closing sections 6b and 6c shown with the slash as an opening-and-closing means for moving together with the barrier 2 and the barrier 3, and opening and closing a part of opening 8a (the direction of a vertical angle) of the barrier covering 8 are formed by one. Moreover, bigger opening 6a to the barrier drive ring 6 than photography opening 1b of the lens-barrel frame 1, the cam which has 6d of cam sides as the connection section where shaft 3b of the barrier 2 contacts -- a hole -- with 6e the cam which has 6f of cam sides as the connection section where shaft 3b of the barrier 3 contacts -- with 6g of holes Hook 6h for hanging the end of the spring 7 which is carrying out rotation energization of the barrier drive ring 6 clockwise in drawing 2 (the barrier is energized in the direction of an aperture) is formed, and the other end of a spring 7 is hung on shaft 1j of the lens-barrel frame 1.

[0032] furthermore, follower arm 6i which extends to a lens-barrel back side an optical axis -- meeting -- forms in the direction of an axis at the periphery section of the barrier drive ring 6 -- having -- **** -- follower arm 6i -- the hole of the lens-barrel frame 1 -- 1c is penetrated and cam side 10a (refer to drawing 3 and drawing 9) formed in the front end side peripheral face of the cope plate 10 which has a shutter and a mechanical component is contacted

[0033] Therefore, if the lens-barrel frame 1 moves back along with an optical axis, follower arm 6i will be slippery along with cam side 10a of a cope plate 10. Consequently, the barrier drive ring 6 rotates counterclockwise in drawing 6 focusing on an optical axis with the reaction force received from cam side 10a, and barrier 2 and 3 drives in the direction of closing with the barrier drive ring 6.

[0034] In the gestalt of this operation shown above Opening 8a of the barrier covering 8, Each physical relationship of opening 6a of the barrier drive ring 6, the opening-and-closing sections 6b and 6c of the barrier drive ring 6, and barrier 2 and 3 As opposed to opening 8a of the barrier covering 8 with which four sides shown according to a two-dot chain line are curving to the whole in the barrier close-by-pass-bulb-completely state shown in drawing 2 Opening 6a of the barrier drive ring 6 is held in the state where it inclined aslant at a barrier closed position, and the barrier 2 and 3 of a couple is held at the barrier closed position so that it may have a crevice in the corner in the diagonal position of opening 8a of the barrier covering 8. And it is located so that the crevice between the corners which have the opening-and-closing sections 6b and 6c prepared in the periphery of opening 6a of the barrier drive ring 6 in this diagonal position may be taken up. Therefore, opening 8a of the barrier covering 8 will be closed by barrier 2 and 3 and the opening-and-closing sections 6b and 6c of the barrier drive ring 6.

[0035] From the barrier (inclination state) close-by-pass-bulb-completely state where opening 6a of this barrier drive ring 6 shifted the phase counterclockwise to opening 8a of the barrier covering 8 If the barrier drive ring 6 is clockwise rotated until it becomes in phase to this opening 8a about this opening 6a Naturally, the opening-and-closing sections 6b and 6c of the barrier drive ring 6 evacuate from the inside of this opening 8a, barrier 2 and 3 will evacuate from the inside of opening 6a and opening 8a, and opening 8a of the barrier covering 8 will be in a full open state.

[0036] Operation of the composition of the form of this operation described above below is explained briefly.

[0037] If the main switch of a camera is turned ON when opening a barrier from the state which the barrier shown in drawing 5 from drawing 2 closed, with the lens-barrel drive which has a non-illustrated motor The lens-barrel frame 1 which had collapsed in the non-illustrated main part of a camera lets out toward the camera front (drawing 3 upper part) from the collapsing position of drawing 3, and follower arm 6i of the lens-barrel frame 1 and the barrier drive ring 6 which moves forward to one separates from cam side 10a by the side of the front end of a cope plate 10.

[0038] and the drive ring 6 which resisted the energization force of a spring 7 and was held at the closed position rotates clockwise (the direction of a barrier aperture) in drawing 2 according to the spring force of a spring 7 -- having -- the opening-and-closing sections 6b and 6c of the barrier drive ring 6, and a cam -- it moves to a clockwise rotation from the position of drawing 2 also Holes 6e and 6g and hook 6h

[0039] for this reason -- while the opening-and-closing sections 6b and 6c of the barrier drive ring 6 evacuate to the outside of opening 8a of the barrier covering 8 -- shaft 2b of a barrier 2 -- the cam of the barrier drive ring 6 -- a hole -- in order to move along 6d of cam sides of 6e -- a barrier 2 -- a hole -- it rotates clockwise (the direction of a barrier aperture) focusing on 2a, and evacuates to the outside of opening 8a of the barrier covering 8

[0040] this time -- rotation of a barrier 2 -- interlocking -- a spring 4 -- a hole -- focusing on 2a, it rotates clockwise and is charged moreover -- simultaneous -- shaft 3b of a barrier 3 -- the cam of the barrier drive ring 6 -- in order to move along 6f of cam sides of 6g of holes -- a barrier 3 -- a hole -- it rotates clockwise (the direction of a barrier aperture) focusing on 3a, and evacuates to the outside of opening 8a of the barrier covering 8 this time -- rotation of a barrier 3 -- interlocking -- a spring 5 -- a hole -- focusing on 3a, it rotates clockwise and is charged And after barriers 2 and 3 open with the opening-and-closing sections 6b and 6c of the barrier drive ring 6, as a spring 7 shows to drawing 8 from drawing 6, a barrier aperture state is held.

[0041] If the main switch of a camera is turned off when closing a barrier from the state which the barrier shown in drawing 8 from drawing 6 opened on the other hand If the lens-barrel frame 1 is rounded toward the collapsing position of the main part of a camera from the position of drawing 7 by the lens-barrel drive which has a non-illustrated motor After follower arm 6i of the lens-barrel frame 1 and the barrier drive ring 6 which goes astern to one contacts cam side 10a by the side of the front end of a cope plate 10, it slides along with cam side 10a. While the barrier drive ring 6 charges a spring 7 through follower arm 6i with the reaction force from cam side 10a, in drawing 6, it rotates counterclockwise (the direction of barrier closing). the opening-and-closing sections 6b and 6c of the barrier drive ring 6, and a cam -- it moves to a counterclockwise rotation from the position of drawing 6 also Holes 6e and 6g and hook 6h

[0042] For this reason, while the opening-and-closing sections 6b and 6c of the barrier drive ring 6 advance inside opening 8a of the

barrier covering 8 and close a part of opening 8a (the direction of a vertical angle) shaft 2b of a barrier 2 -- the cam of the barrier drive ring 6 -- a hole -- in order to move along 6d of cam sides of 6e -- a spring 4 -- a barrier 2 -- a hole -- it rotates counterclockwise (the direction of barrier closing) focusing on 2a, and advances inside opening 8a of the barrier covering 8 [0043] moreover -- simultaneous -- a barrier 3 -- shaft 3b -- the cam of the barrier drive ring 6 -- in order to move along 6f of cam sides which are 6g of holes -- a spring 5 -- the hole of a barrier 3 -- it rotates counterclockwise (the direction of barrier closing) focusing on 3a, and advances inside opening 8a of the barrier covering 8 And after the opening-and-closing sections 6b and 6c of the barrier drive ring 6 close and barriers 2 and 3 close by cam side-10a of a cope plate 10, as the spring force of springs 4 and 5 shows to drawing 5 from drawing 1, a barrier closing state is held.

[0044] Since the opening-and-closing sections 6b and 6c shown in the barrier drive ring 6 with the slash as an opening-and-closing means were formed, in the form of this operation, a part of opening 8a (the direction of a vertical angle) of the barrier covering 8 can be opened and closed, without increasing the number of sheets of a barrier. Moreover, it is not necessary to lengthen the overall length of barrier equipment, and the miniaturization of a lens barrel can be attained.

[form of the 2nd operation] drawing 10.

[0045] Drawing 13 shows the form of operation of the 2nd of the invention.
[0046] Since the mechanical structure in the form of this operation is almost the same as the thing of the form of the 1st operation, the same thing as the structure element shown in the form of the 1st operation is expressed as the same sign as drawing 1 to drawing 9 also in drawing 13 from drawing 10, and omits explanation about these structure elements. Moreover, since it is the same as the form of the operation of the mechanism of the form of the 2nd operation, explanation is omitted.

[0047] The D-D view cross section of drawing 11 and drawing 13 of the decomposition perspective diagram in which drawing 10 shows the composition of barrier equipment, the front view showing the state where the barrier carried out the close by-pass bulb completely of drawing 11, and drawing 12 are the E-E view cross sections of drawing 11.

completely of drawing 11, and drawing 12 are the E-E view cross sections of drawing 11. [0048] the opening and closing that whose it differs from the form of the 1st operation with the form of operation of *** 2 opens and

[0048] the opening and closing -- it is having newly formed the member 21
closes a part of opening 8a of the barrier covering 8 -- the opening-and-closing sections 21b and 21c shown with the slash as
[0049] the opening and closing in the form of this operation -- the opening-and-closing sections 21b and 21c shown with the slash as
an opening-and-closing means for opening and closing a part of bigger opening 21a than photography opening 1b of the lens-barrel
frame 1 and opening 8a (the direction of a vertical angle) of the barrier covering 8 and 21d of heights which prevent the swing and tilt
of opening 21a and 21c are formed in the perimeter of opening 21a, and Shafts 21e and 21f are implanted in the member 21

of barriers 2 and 3 are formed in the perimeter of opening 21a, and Shafts 21e and 21f are implanted in the member 21 -- opening 6a of the barrier drive ring 6 -- fitting in -- shaft 21e -- the hole of the barrier [0050] opening and closing -- a member 21 -- opening 6a of the barrier drive ring 6 -- fitting in -- shaft 21f -- the hole of the barrier drive ring 6 -- 6j and 21f of shafts -- the hole of the barrier drive ring 6 -- since it has fitted in with 6k, it rotates by the barrier drive ring 6 and one

ring 6 and one [0051] the opening and closing which have the opening-and-closing sections 21b and 21c (slash section) in the form of this operation - since a member 21 is formed and a part of opening 8a (the direction of a vertical angle) of the barrier covering 8 is opened and closed, while being able to close opening 8a of the barrier covering 8, without increasing the number of sheets of a barrier, the miniaturization (especially outer diameter) of a lens barrel can be attained moreover, opening and closing -- since 21d of heights was prepared in the member 21, the swing and tilt in the middle of opening and closing of barriers 2 and 3, and when a close by-pass bulb completely is carried out, barriers 2 and 3 can be doubled without a level difference where 21 can be narrowed, while the

completely is carried out, barriers 2 and 3 can be doubled without trouble -- furthermore, barriers 2 and 3 and opening and closing -- since the crevice between members 21 can be narrowed, while the probability which invades [dust] decreases, even if dust etc. trespasses upon a barriers 2 and 3 and 21d [of heights] crevice -- barriers 2 and 3 and opening and closing -- the dust which invaded is removed and a member 21 does not have a possibility of causing trouble to operation of barriers 2 and 3, in order to rotate mutually

[0053] [Form of the 3rd operation] drawing 14 and drawing 15 show the form of operation of the 3rd of this invention.

[0053] [Form of the 3rd operation] drawing 14 and drawing 15 show the form of the 3rd operation. The mechanical structure in the form of this operation is almost the same as the thing of the form of the 1st operation, the same thing as the structure element shown in the form of the 1st operation displays the same sign as drawing 9 from drawing 1 also in drawing 14 and drawing 15.

[0055] The decomposition perspective diagram showing the barrier equipment with which drawing 14 consists of units, and drawing 15 are the perspective diagrams showing a barrier equipment unit and a lens-barrel frame.

[0056] It is the lens-barrel frame with which 1 is arranged possible [movement in the direction of an optical axis] in drawing 14 and drawing 15 . The lens maintenance cylinder 9 (photography optical system) shown in drawing 3 and drawing 7 , and ahead the barrier equipment unit 30 mentioned later is connected in the back inside the lens-barrel frame 1, and the lens maintenance cylinder 9 and the barrier equipment unit 30 move in the direction of an optical axis united with the lens-barrel frame 1, when the lens-barrel frame 1 moves in the direction of an optical axis. the hole which front end board 1a is formed in the position entered from the front end section of the lens-barrel frame 1 to back, and opening 1b and follower arm 6i of the barrier drive ring 6 penetrate in the center of front end board 1a -- 1c and the hole for carrying out optical adjustment -- 1k is formed

[0057] 31 is the barrier cope plate which constitutes the newly prepared barrier equipment unit 30. Photography opening 31b formation is carried out. front end board 31a is formed in the position entered from the front end section to back, and the photography optical system of the lens maintenance cylinder 9 is received at the center of front end section 31a -- the hole which follower arm 6i of the barrier drive ring 6 penetrates around photography opening 31b -- 31c being formed and with the shafts 31d and 31e which support barriers 2 and 3 possible [rotation] Shaft 31j which hangs the heights 31f and 31g which support a barrier drive ring in the direction of an optical axis, the shafts 31h (un-illustrating) and 31i which hang the end of springs 4 and 5, and the end of a spring 7 is implanted in an optical axis and parallel.

[0058] The barrier equipment unit 30 consists of barriers 2 and 3 which the barrier covering 8 with bigger opening 8a than photography opening 31b is arranged at the front end section of the barrier cope plate 31, and are later mentioned between front end board 31a and the barrier covering 8, a barrier drive ring 6, and arranging a spring 4, and 5 and 7.

[0059] The barriers 2 and 3 of a couple are arranged behind the barrier covering 8, and are driven with the barrier drive ring 6 which rotates in the flat-surface top which intersects perpendicularly with the direction of an optical axis mostly, opens and closes opening

8a of the barrier covering 8, and is mentioned later.

[0060] the hole with which the barrier 2 was formed in the end face section -- the hole with which fitting support of the rotation of 2a on 31d of shafts of the barrier cope plate 31 was enabled, and the barrier 3 was similarly formed in the end face section -- fitting support of the rotation of 3a to shaft 31e of the barrier cope plate 31 is enabled

[0061] the hole of a barrier 2 -- the cam by which shaft 2b driven with the barrier drive ring 6 was implanted in the near position of 2a, and shaft 2b was formed in the barrier drive ring 6 -- a hole -- it is arranged in 6e

[0062] moreover, it arranges on 31d of shafts of the barrier cope plate 31, and the same axle -- having -- a hole -- shaft 2c for hanging the end of the spring 4 which is carrying out rotation energization counterclockwise in drawing 14 the center [2a] (a barrier is energized in the direction of closing) is implanted in the barrier 2, and the other end of a spring 4 is hung on 31h of shafts of the barrier cope plate 31 namely, the barrier 2 -- a spring 4 -- shaft 2b -- a cam -- a hole -- you make 6d of cam sides formed in 6e contact, and are making it the barrier drive ring 6 interlocked with

[0063] the same -- the hole of a barrier 3 -- the cam by which shaft 3b driven with the barrier drive ring 6 was implanted in the near position of 3a, and shaft 3b was formed in the barrier drive ring 6 -- it is arranged in 6g of holes

[0064] moreover, it arranges on shaft 31e of the barrier cope plate 31, and the same axle -- having -- a hole -- shaft 3c for hanging the end of the spring 5 which is carrying out rotation energization counterclockwise in drawing 2 the center [3a] (a barrier is energized in the direction of closing) is implanted in the barrier 3, and the other end of a spring 5 is hung on shaft 31i of the barrier cope plate 31

[0065] namely, the barrier 3 -- a spring 5 -- shaft 3b -- a cam -- you make 6f of cam sides formed in 6g of holes contact, and are making it the barrier drive ring 6 interlocked with

[0066] Fit into the inner circumference of the barrier cope plate 31 possible [rotation] focusing on an optical axis, interlock and rotate to movement in the direction of an optical axis of the lens-barrel frame 1, and the barrier drive ring 6 makes barriers 2 and 3 drive, is arranged ahead of barriers 2 and 3, and is supported by the heights 31f and 31g of the barrier cope plate 31.

[0067] The opening-and-closing sections 6b and 6c shown in the barrier drive ring 6 with the slash as an opening-and-closing means to open and close a part of opening 8a (the direction of a vertical angle) of the barrier covering 8 like barriers 2 and 3 as shown in drawing 14 are formed by one. the cam which has 6d of cam sides as the connection section where bigger opening 6a than photography opening 31b of the barrier cope plate 31 and shaft 2b of a barrier 2 contact -- a hole -- with 6e the cam which has 6f of cam sides as the connection section where shaft 3b of a barrier 3 contacts -- with 6g of holes Hook 6h for hanging the end of the spring 7 which is carrying out rotation energization of the barrier drive ring 6 clockwise in drawing 14 (a barrier is energized in the direction of an aperture) is formed, and the other end of a spring 7 is hung on shaft 31j of the barrier cope plate 31.

[0068] furthermore, follower arm 6i which extends to a lens-barrel back side an optical axis -- meeting -- forms in the direction of an axis at the periphery section of the barrier drive ring 6 -- having -- **** -- follower arm 6i -- the hole of hole 31c of the barrier cope plate 31, and the lens-barrel frame 1 -- 1c is penetrated and cam side 10a (refer to drawing 9) formed in the front end side peripheral face of the cope plate 10 which has a shutter and a mechanical component is contacted Therefore, if the lens-barrel frame 1 carries out back movement along with an optical axis, follower arm 6i will be slippery along with cam side 10a of a cope plate 10. Consequently, the barrier drive ring 6 rotates counterclockwise in drawing 14 focusing on an optical axis with the reaction force received from cam side 10a, and barriers 2 and 3 drive in the direction of closing with the barrier drive ring 6.

[0069] Operation of the above-mentioned composition is explained briefly below.

[0070] When opening a barrier from the state which the barrier closed, the lens-barrel frame 1 lets out toward the front of the main part of a camera like drawing 3 in the form of the 1st operation by turning on the main switch of a camera with the lens-barrel drive which has a non-illustrated motor from the collapsing position of the main part of a camera.

[0071] And follower arm 6i of the lens-barrel frame 1 and the barrier drive ring 6 arranged in the barrier drive unit 30 which moves forward to one separates from cam side 10a by the side of the front end of a cope plate 10. the barrier drive ring 6 rotates clockwise (the direction of a barrier aperture) in drawing 14 with a spring 7 -- having -- the opening-and-closing sections 6b and 6c of the barrier drive ring 6, and a cam -- it moves to a clockwise rotation from the position of drawing 14 also Holes 6e and 6g and hook 6h

[0072] for this reason -- while the opening-and-closing sections 6b and 6c of the barrier drive ring 6 evacuate to the outside of opening 8a of the barrier covering 8 -- shaft 2b of the barrier 2 -- the cam of the barrier drive ring 6 -- a hole -- in order to move along 6d of cam sides of 6e -- the barrier 2 -- a hole -- it rotates clockwise (the direction of a barrier aperture) focusing on 2a, and evacuates to the outside of opening 8a of the barrier covering 8 this time -- rotation of the barrier 2 -- interlocking -- a spring 4 -- a hole -- focusing on 2a, it rotates clockwise and is charged

[0073] moreover -- simultaneous -- shaft 3b of the barrier 3 -- the cam of the barrier drive ring 6 -- in order to move along 6f of cam sides of 6g of holes -- the barrier 3 -- a hole -- it rotates clockwise (the direction of a barrier aperture) focusing on 3a, and evacuates to the outside of opening 8a of the barrier covering 8 this time -- rotation of the barrier 3 -- interlocking -- a spring 5 -- a hole -- focusing on 3a, it rotates clockwise and is charged And after-barrier 2 and 3 opens with the opening-and-closing sections 6b and 6c of the barrier drive ring 6, a barrier aperture state is held with a spring 7.

[0074] On the other hand, when closing the barrier from the state which the barrier opened, by turning OFF a main switch If it marches into the collapsing position from the photography position like drawing 7 in the gestalt of the 1st operation with the lens-barrel drive which has a non-illustrated motor After follower arm 6i of the lens-barrel frame 1 and the barrier drive ring 6 arranged in the barrier equipment unit which goes astern to one contacts cam side 10a by the side of the front end of a cope plate 10, it slides along with cam side 10a. While the barrier drive ring 6 charges a spring 7 through follower arm 6i with the reaction force from cam side 10a, in drawing 14 , it rotates counterclockwise (the direction of barrier closing). the opening-and-closing sections 6b and 6c of the barrier drive ring 6, and a cam -- it moves to a counterclockwise rotation from the position of drawing 14 also Holes 6e and 6g and hook 6h

[0075] For this reason, while the opening-and-closing sections 6b and 6c of the barrier drive ring 6 advance inside opening 8a of the barrier covering 8 and close a part of opening 8a (the direction of a vertical angle) shaft 2b of the barrier 2 -- the cam of the barrier drive ring 6 -- a hole -- in order to move along 6d of cam sides of 6e -- a spring 4 -- the barrier 2 -- a hole -- it rotates counterclockwise

(the direction of barrier closing) focusing on 2a, and advances inside opening 8a of the barrier covering 8 [0076] moreover -- simultaneous -- the barrier 3 -- shaft 3b -- the cam of the barrier drive ring 6 -- in order to move along 6f of cam sides which are 6g of holes -- a spring 5 -- the hole of the barrier 3 -- it rotates counterclockwise (the direction of barrier closing) focusing on 3a, and advances inside opening 8a of the barrier covering 8 [0077] And after the opening-and-closing sections 6b and 6c of the barrier drive ring 6 close and barrier 2 and 3 closes by cam side 10a of a cope plate 10, as the spring force of springs 4 and 5 shows to drawing 15, a barrier closing state is held. [0078] It is the above-mentioned barrier equipment which consists of units in the gestalt of the 3rd operation, and since the opening-and-closing sections 6b and 6c were formed in the barrier drive ring 6, a part of opening 8a (the direction of a vertical angle) of the barrier covering 8 can be opened and closed, without increasing the number of sheets of the barrier. Moreover, it is not necessary to lengthen the overall length of a barrier equipment unit, and the miniaturization of a lens barrel can be attained. [0079] In the gestalt of the above operation, the lens-barrel frame 1 is equivalent to the lens-barrel member of this invention. (Correspondence of the gestalt of invention and operation) The barrier covering 8 which has barrier opening 8a is equivalent to barrier covering which has barrier opening of this invention. Barrier 2 and 3 is equivalent to the barrier of the couple of this invention, the opening-and-closing sections 6b and 6c are equivalent to the opening-and-closing means of this invention, and the barrier drive ring 6 is equivalent to the rotation member of this invention. The barrier drive ring 6 and the cam sides 6d and 6f, The cope plate 10 which has follower arm 6i and cam side 10a is equivalent to barrier driving means. Moreover, the cope plate 10 which has follower arm 6i and cam side 10a is equivalent to the connection means of this invention. Furthermore, 21d of heights is equivalent to a contact member. [0080] In addition, although the above is the correspondence relation between each composition of this invention, and each composition of the gestalt of operation, if this invention is the composition that the function which it is not restricted to the composition of these operation gestalt, and was shown by the claim, or the function which the composition of the gestalt of operation has can be attained, it cannot be overemphasized by that you may be what thing. [0081] Moreover, this invention can apply a further also to optical instruments other than a camera, other equipments, and the equipment of those cameras, optical instruments, and others, the equipment further applied to the equipment of these cameras, an optical instrument, or others or the element which constitutes these also to cameras of various gestalten, such as a single-lens reflex camera, a lens shutter camera, and a video camera, further. [0082] The whole composition of a claim or the gestalt of operation or the part of this invention is moreover, like the element which constitutes equipment with other equipments so that may join together so that may form one equipment. [0083] [Effect of the Invention] According to invention concerning claims 1-7, opening of the aforementioned barrier covering can be opened and closed, without increasing the number of sheets of the barrier. Moreover, while being able to constitute without lengthening the overall length of barrier equipment, the miniaturization of a lens barrel can be attained. [0084] Moreover, the swing and tilt in the middle of opening and closing of the barrier, and when a close by-pass bulb completely is carried out, the barrier can be doubled without a level difference. Furthermore, since the crevice between the aforementioned barrier and the aforementioned opening-and-closing member can be narrowed, while the probability which invades [dust] decreases, even if dust etc. trespasses upon the crevice between the barrier and the aforementioned heights, the dust which invaded is removed and the barrier and an opening-and-closing member do not have a possibility of causing trouble to operation of the barrier, in order to rotate mutually.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The decomposition perspective diagram of the barrier equipment in the gestalt of operation of the 1st of this invention.
 [Drawing 2] Front view having shown only photography opening of barrier covering after the barrier had carried out the close by-pass bulb completely with the gestalt of operation of the 1st of this invention.
 [Drawing 3] Drawing in the state where barrier covering is formed with the A-A view cross section of drawing 2 by the gestalt of operation of the 1st of this invention.
 [Drawing 4] The state diagram to which the barrier drive ring closed some barrier coverings with the B-B view cross section of drawing 2 by the gestalt of operation of the 1st of this invention.
 [Drawing 5] The perspective diagram showing the state where the barrier carried out the close by-pass bulb completely with the gestalt of operation of the 1st of this invention.
 [Drawing 6] Front view having shown only photography opening of barrier covering after the barrier had opened fully with the gestalt of operation of the 1st of this invention.
 [Drawing 7] Drawing in the state where barrier covering is formed with the C-C view cross section of drawing 6 by the gestalt of operation of the 1st of this invention.
 [Drawing 8] The perspective diagram having shown only photography opening of barrier covering after the barrier had opened fully with the gestalt of operation of the 1st of this invention.
 [Drawing 9] The schematic diagram showing the relation between the cam side of a cope plate, and the follower arm of a barrier drive ring with the form of operation of the 1st of this invention.
 [Drawing 10] It is the decomposition perspective diagram of barrier equipment at the form of operation of the 2nd of this invention.
 [Drawing 11] Front view having shown only photography opening of barrier covering after the barrier had carried out the close by-pass bulb completely with the form of operation of the 2nd of this invention.
 [Drawing 12] Drawing in the state where barrier covering is formed with the D-D view cross section of drawing 11 by the form of operation of the 2nd of this invention.
 [Drawing 13] The state diagram to which the barrier drive ring closed some barrier coverings with the E-E view cross section of drawing 11 by the form of operation of the 2nd of this invention.
 [Drawing 14] The decomposition perspective diagram showing the barrier equipment by which a unit configuration is carried out with the form of operation of the 3rd of this invention.
 [Drawing 15] The perspective diagram showing a barrier equipment unit and a lens-barrel frame with the form of operation of the 3rd of this invention.
 [Drawing 16] Front view from which a barrier drive ring and barrier covering were removed after the barrier of the barrier equipment of the conventional camera had carried out the close by-pass bulb completely.
 [Drawing 17] Front view from which a barrier drive ring and barrier covering were removed after the barrier of the barrier equipment of the conventional camera had opened fully.

[Description of Notations]

- 1,101 -- Lens-barrel frame
- 1a, 31a -- Front end board
- 1b, 31b -- Photography opening
- 1c, 2a, 3a, 6j, 6k, 31c -- Hole
- 1d, 1e, 1h, 1i, 1j -- Shaft
- 2b, 2c, 3b, 3c, 21e, 21f, 31d, 31e, 31h, 31i, 31j, 1f, 1g, 21d, 31f, 31g -- Heights
- 2 3,102,103 -- Barrier
- 4, 5, 7 -- Spring
- 6 -- Barrier drive ring
- 6a, 8a, 21a, 108a -- Opening
- 6b, 6c, 21b, 21c -- Opening-and-closing section
- 6d, 6f, 10a -- Cam side
- 6e and 6g-- cam -- a hole
- 6h -- Hook
- 6i -- Follower arm
- 8,108 -- Barrier covering
- 9 -- Lens maintenance cylinder
- 10 -- cope-plate 21 -- opening and closing -- a member

30 -- Barrier equipment unit
31 -- Barrier cope plate

[Translation done.]

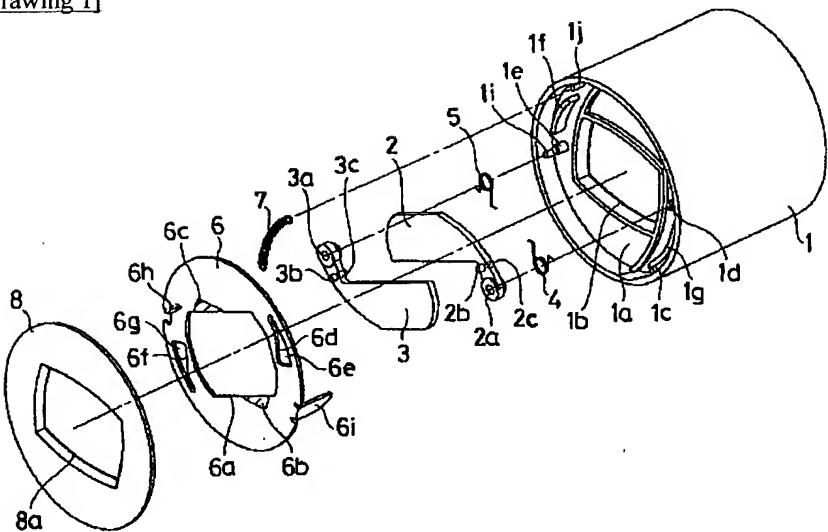
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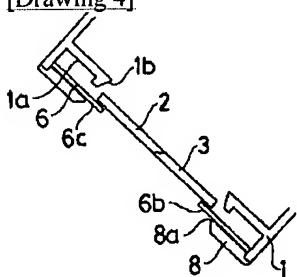
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DRAWINGS

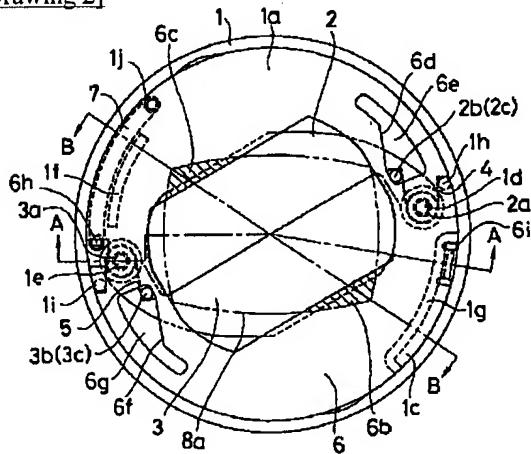
[Drawing 1]



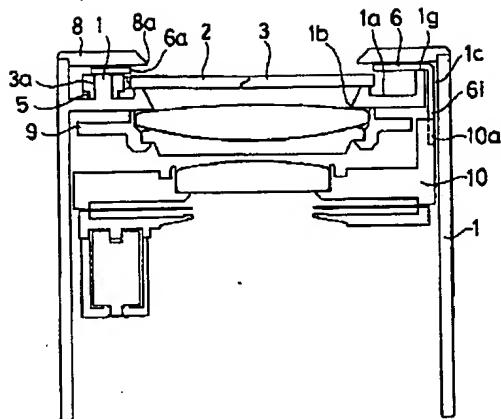
[Drawing 4]



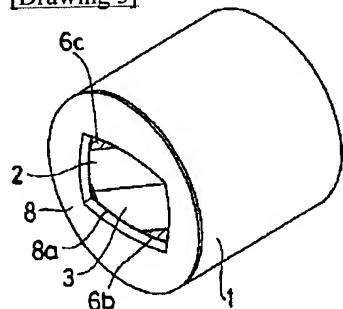
[Drawing 2]



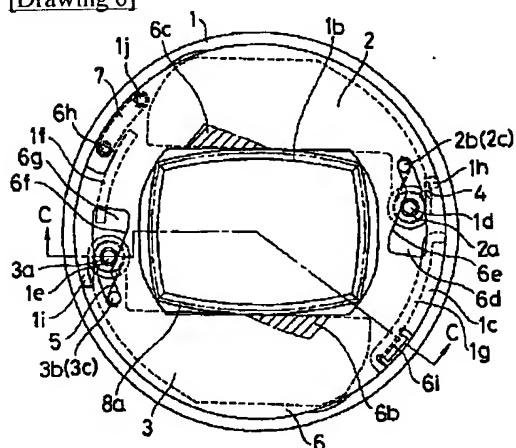
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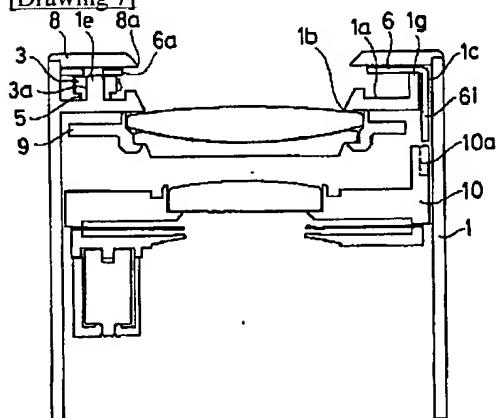
[Drawing 5]



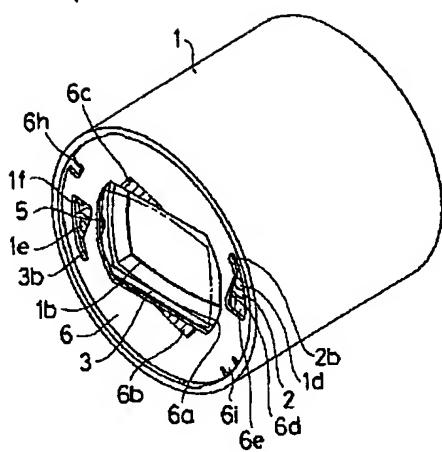
[Drawing 6]



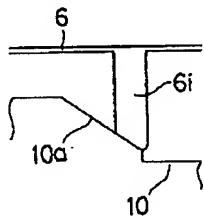
[Drawing 7]



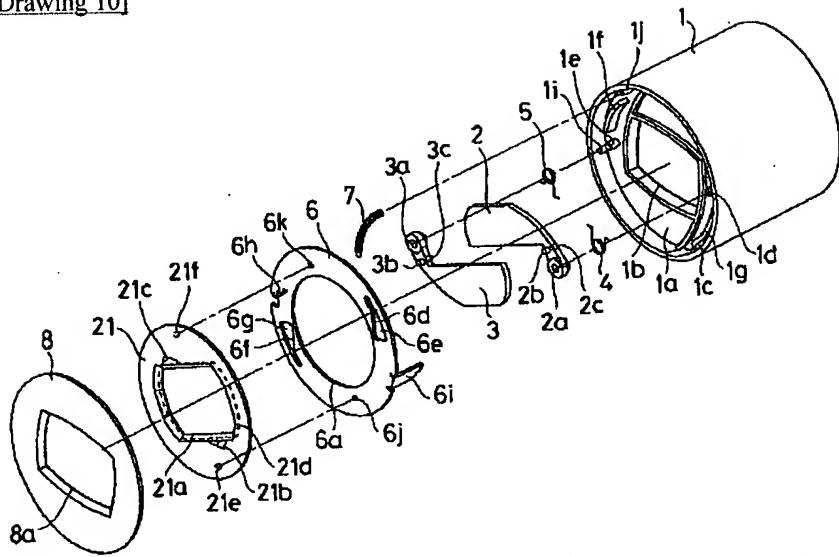
[Drawing 8]



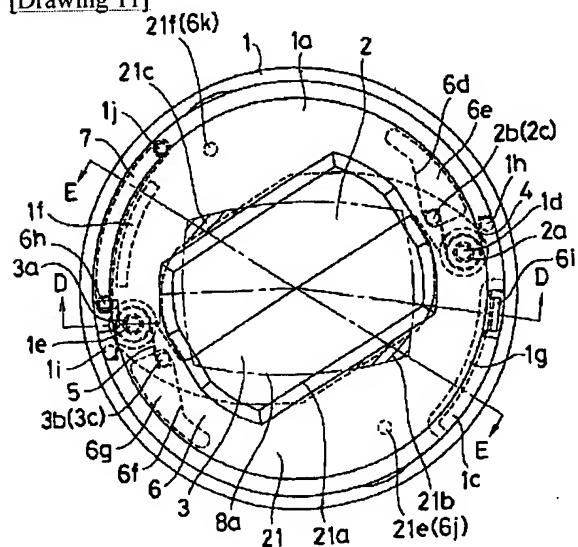
[Drawing 9]

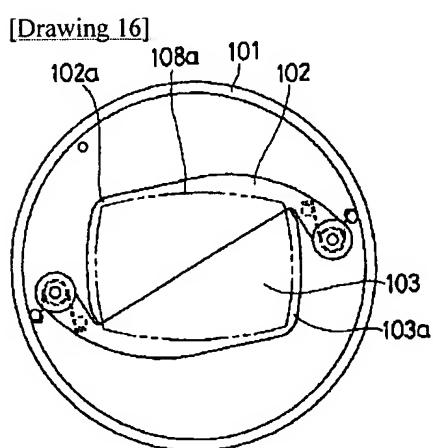
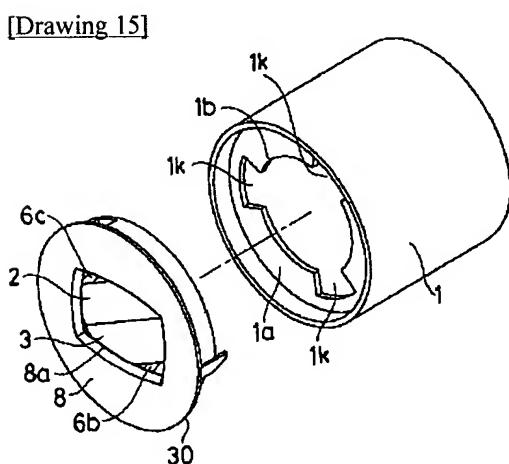
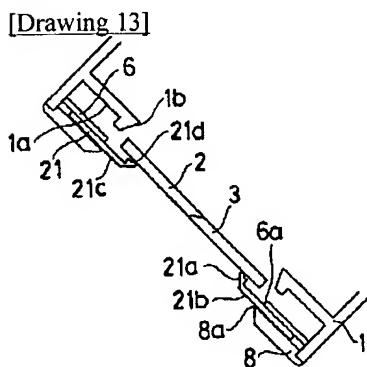
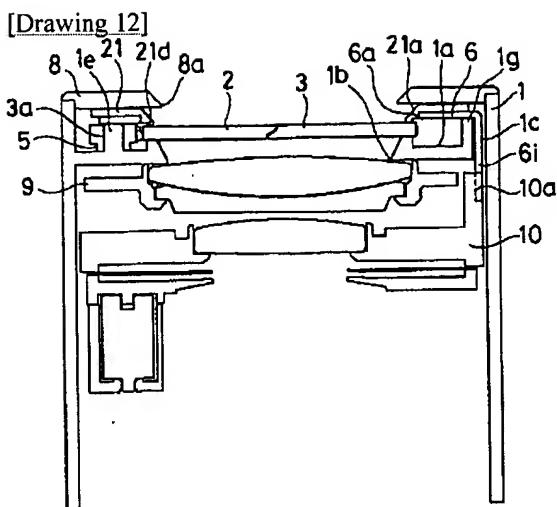


[Drawing 10]

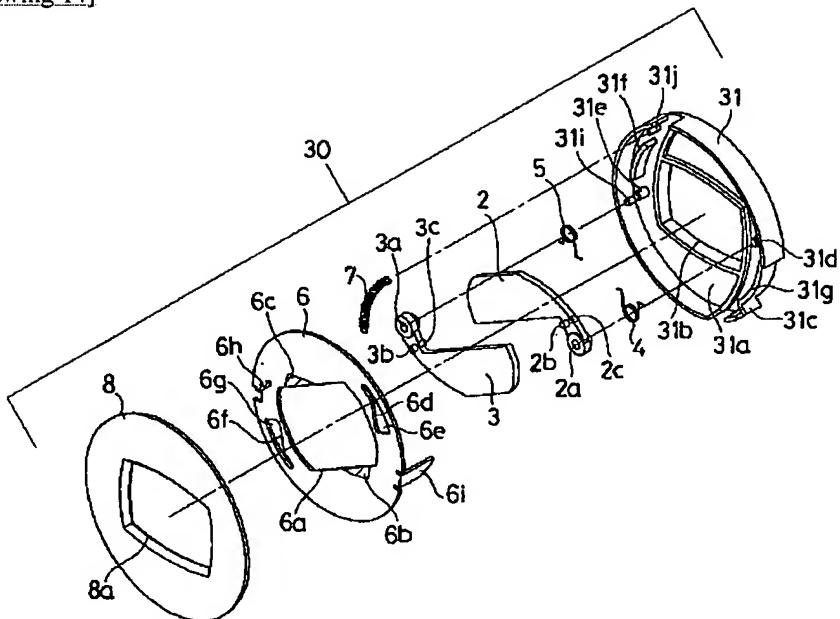


[Drawing 11]

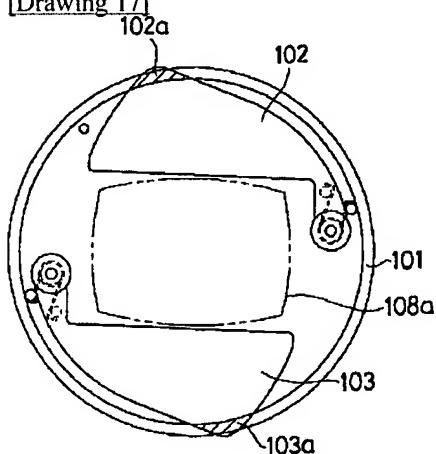




[Drawing 14]



[Drawing 17]



[Translation done.]

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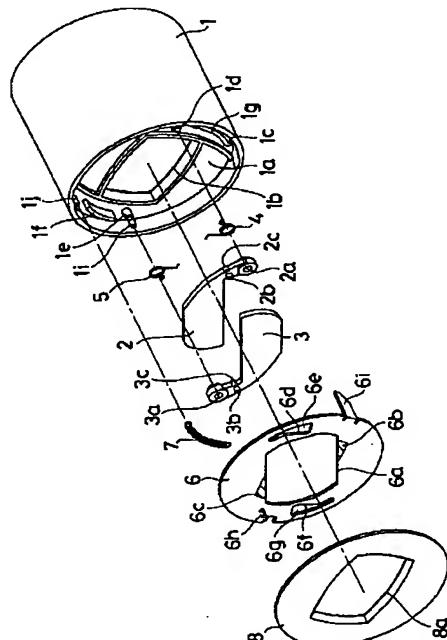
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(54) 【発明の名称】 カメラ

(57) 【要約】

【課題】 簡単な構成で確実に開閉作動でき、またカメラの小型化が図れるカメラを提供することにある。

【解決手段】 撮影用開口部1bを有する撮影光学系内蔵の鏡筒部材1と、バリア開口部8aを有する鏡筒部材1の前部に設けられたバリアカバー8と、バリア開口部に対して非遮光領域を有して遮光する全閉位置と該バリア開口部から退避した全開位置との間を移動可能な一对のバリア(2、3)と、前記全閉位置で前記非遮光領域を遮光し、前記全開位置で該非遮光領域から退避する開閉手段(6b、6c)と、光軸を中心として回動部材6が回動することにより一对のバリアと前記開閉手段とを全閉位置と全開位置に移動させるバリア駆動手段(6d、6f、6i)とを有する。



【特許請求の範囲】

【請求項1】 撮影用開口部を有する撮影光学系内蔵の鏡筒部材と、バリア開口部を有する前記鏡筒部材の前部に設けられたバリアカバーと、前記バリア開口部に対して非遮光領域を有して遮光する全閉位置と該バリア開口部から退避した全開位置との間を移動可能な一対のバリアと、前記全閉位置で前記非遮光領域を遮光し、前記全開位置で該非遮光領域から退避する開閉手段と、光軸を中心として回動部材が回動することにより前記一対のバリアと前記開閉手段とを全閉位置と全開位置に移動させるバリア駆動手段とを有することを特徴とするカメラ。

【請求項2】 請求項1において、前記バリアカバーと、前記一対のバリアと、前記開閉手段と、前記バリア駆動手段とを一体に組み付けてユニット化したことを特徴とするバリア装置。

【請求項3】 請求項1または2において、前記バリア駆動手段は、前記鏡筒部材の光軸方向の移動に応じて回動部材を回動させる連結手段を有することを特徴とするカメラ。

【請求項4】 請求項3において、前記開閉手段は、前記バリア駆動手段の回動部材に設けられていることを特徴するカメラ。

【請求項5】 請求項3において、前記開閉手段は、前記バリア駆動手段の回動部材とは別の部材に設けられていることを特徴とするカメラ。

【請求項6】 請求項1、2、3、4または5において、前記バリア開口部は前記撮影用開口部よりも大きく形成されていることを特徴とするカメラ。

【請求項7】 請求項1、2、3、4、5または6において、前記一対のバリアと光軸方向に沿って当接する当接部材を前記バリア駆動手段の回動部材に設けたことを特徴とするカメラ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明はカメラに係り、特に撮影光学系を保護するためにカメラのレンズ前面に設けられたバリア装置に関するものである。

【0002】

【従来の技術】図16及び図17を参照して従来のレンズシャッターカメラのバリア装置について説明する。

【0003】図16はバリアが全閉した状態を示す要部正面図、図17はバリアが全開した状態を示す要部正面図である。

【0004】図16に示すように、外径を小さくした鏡筒枠101に2枚のバリア102及び103が配置され、該バリア102及び103で鏡筒枠101の前端部に配置されたバリアカバー108の開口部108aを閉じる構成にすると、図17に示すように、不図示のバリア駆動リングによりバリア102及び103が全開すると、バリアカバー108の開口部108aの対角部を覆

っているバリア102及び103の斜線で示す先端部102a及び103aが、鏡筒枠101の外径より出張ってしまうため、従来、鏡筒枠101の外径を大きくしてバリア102及び103の先端部102a及び103aが出張らないようにしていた。

【0005】しかし、鏡筒枠101の外径が大きくなってしまうことから、レンズ鏡筒の小型化が困難であった。そこで、実開平3-18519号公報のレンズのバリア装置が提案されている。上記実開平3-18519号公報に記載されているレンズのバリア装置は、バリア駆動リングで駆動する第1のバリアと、該第1のバリアに連動して駆動する第2のバリアで構成される4枚のバリアで、レンズ鏡筒のレンズ開口の開閉を行うようにしたものである。

【0006】

【発明が解決しようとする課題】しかしながら、上記従来のバリア装置においては次のような欠点があった。

【0007】鏡筒枠の外径を大きくすることなく、バリア全開時レンズ鏡筒のレンズ開口の外側へ退避させることができるが、バリアの枚数が2枚から4枚に増やし、バリアを板厚方向に位置をずらせて配置しているので、バリア装置の全長が長くなる。また、バリア装置の構成が複雑になると共に、各部品の隙間が多くなり異物が侵入しやすく、侵入した異物によりバリアが開閉しなくなってしまうという事故を生じる危険があった。

【0008】本出願に係る発明の目的は、簡単な構成で確実に開閉作動でき、またカメラの小型化が図れるカメラを提供することにある。

【0009】

【課題を解決するための手段】本出願に係る発明の目的を実現する第1の構成は、撮影用開口部を有する撮影光学系内蔵の鏡筒部材と、バリア開口部を有する前記鏡筒部材の前部に設けられたバリアカバーと、前記バリア開口部に対して非遮光領域を有して遮光する全閉位置と該バリア開口部から退避した全開位置との間を移動可能な一対のバリアと、前記全閉位置で前記非遮光領域を遮光し、前記全開位置で該非遮光領域から退避する開閉手段と、光軸を中心として回動部材が回動することにより前記一対のバリアと前記開閉手段とを全閉位置と全開位置に移動させるバリア駆動手段とを有することを特徴とするカメラにある。

【0010】本出願に係る発明の目的を実現する第2の構成は、上記した第1の構成において、前記バリアカバーと、前記一対のバリアと、前記開閉手段と、前記バリア駆動手段とを一体に組み付けてユニット化したことを特徴とするカメラにある。

【0011】本出願に係る発明の目的を実現する第3の構成は、上記の各構成において前記バリア駆動手段は、前記鏡筒部材の光軸方向の移動に応じて回動部材を回動させる連結手段を有することを特徴とするカメラにあ

る。

【0012】本出願に係る発明の目的を実現する第4の構成は、上記した第3の構成において、前記開閉手段は、前記バリア駆動手段の回動部材に設けられていることを特徴するカメラ。

【0013】本出願に係る発明の目的を実現する第5の構成は、上記した第3の構成において、前記開閉手段は、前記バリア駆動手段の回動部材とは別の部材に設けられていることを特徴とするカメラにある。

【0014】本出願に係る発明の目的を実現する第6の構成は、上記した各構成において、前記バリア開口部は前記撮影用開口部よりも大きく形成されていることを特徴とするカメラにある。

【0015】本出願に係る発明の目的を実現する第7の構成は、上記した各構成において、前記一对のバリアと光軸方向に沿って当接する当接部材を前記バリア駆動手段の回動部材に設けたことを特徴とするカメラにある。

【0016】上記の構成によれば、鏡筒部材が例えば繰り出されると、バリア駆動手段の回動部材が回動し、バリア開口部を遮光していた一対のバリアと、一部の非遮光部を遮光していた開閉手段が退避し、バリア開口部が全開する。したがって、バリアの枚数を増やすことなく前記バリアカバーの開口部を開閉することができる。また、バリア装置の全長を長くすることなく構成できると共に、レンズ鏡筒の小型化が図れる。

【0017】また、前記開閉手段を駆動手段の回動部材に一体に形成して、前記バリアカバーの開口部の一部を開閉するので、バリアの枚数を増やすことなく前記バリアカバーの開口部を開閉することができる。またバリア装置の全長を長くすることなく構成することができると共に、レンズ鏡筒の小型化を図ることができる。

【0018】さらに、開閉手段を設けて、前記バリアカバーの開口部の一部を開閉するので、バリアの枚数を増やすことなく該バリアカバーの開口部を閉じることができると共に、レンズ鏡筒の小型化（特に外径）を図ることができる。

【0019】また、例えば前記開閉手段に当接部材との凸部を設けたので、前記一对のバリアの開閉途中のアオリ及び、全閉したときに一对のバリアを段差なく合わせることができる。更に、前記一对のバリアと前記開閉手段との隙間を狭くすることができるので、ゴミ等の侵入する確率が少なくなると共に、ゴミ等が一对のバリアと前記凸部との隙間に侵入しても、該一对のバリアと該開閉手段は互いに回動するため、侵入したゴミ等が除去され、該バリアの動作に支障を来す虞れがない。

【0020】

【発明の実施の形態】

【第1の実施の形態】図1から図9は本発明の第1の実施の形態を示したものである。

【0021】図1はバリア装置の構成を示す分解斜視

図、図2はバリアが全閉した状態を示す正面図、図3は図2のA-A矢視断面図、図4は図2のB-B矢視断面図、図5はバリアが全閉した状態を示す要部斜視図、図6はバリアが全開した状態を示す正面図、図7は図6のC-C矢視断面図、図8はバリアが全開した状態を示す斜視図、図9は駆動部材としてのバリア駆動リングの駆動方法を示す部分側面図である。

【0022】図1から図9において、1は光軸方向移動可能に配置されている鏡筒枠で、該鏡筒枠1の内部の後方には撮影光学系を有するレンズ保持筒9が連結され、レンズ保持筒9は鏡筒枠1が光軸方向に移動するとき、鏡筒枠1と一緒にになって光軸方向に移動する。

【0023】鏡筒枠1の前端部から後方へ入り込んだ位置に前端板1aが形成され、前端板1aの中心にはレンズ保持筒9の撮影光学系に対する撮影開口部1bが形成されている。撮影開口部1bの周辺にはバリア駆動リング6のフォロワーアーム6iが貫通する孔1cが形成され、バリア2及び3を回動可能に支持する軸1d及び1eと、バリア駆動リング6を光軸方向に支持する凸部1f及び1gと、バネ4及び5の一端を掛ける軸1h及び1iと、バネ7の一端を掛ける軸1jが光軸と平行に植設されている。

【0024】前端部には撮影開口部1bより大きな開口部8aを有したバリアカバー8が配置され、前端板1aとバリアカバー8との間に後述するバリア2及び3と、バリア駆動リング6と、バネ4及び5及び7が配置されている。

【0025】一对のバリア2、3はバリアカバー8の後方に配置され、光軸方向とほぼ直交する平面内において回動してバリアカバー8の開口部8aを開閉するようになっており、後述するバリア駆動リング6により駆動される。

【0026】バリア2は、基端部に形成された孔2aが鏡筒枠1の軸1dに回動可能に嵌合支持されバリア3は、同じく基端部に形成された孔3aが鏡筒枠1の軸1eに回動可能に嵌合支持されている。

【0027】バリア2の孔2aの近傍位置にはバリア駆動リング6により駆動される軸2bが植設され、軸2bはバリア駆動リング6に形成されたカム孔6e内に配置されている。また、鏡筒枠1の軸1dと同軸上に配置され、孔2aを中心として図2において反時計方向に回転付勢している（バリアを閉じ方向に付勢する）バネ4の一端を掛けるための軸2cが植設されており、バネ4の他端は鏡筒枠1の軸1hに掛けられている。 すなわち、バリア2はバネ4により軸2bをカム孔6eに形成されるカム面6dに当接させ、バリア駆動リング6に連動させている。

【0028】同様に、バリア3の孔3aの近傍位置にはバリア駆動リング6により駆動される軸3bが植設され、軸3bはバリア駆動リング6に形成されたカム孔6

g内に配置されている。

【0029】また、鏡筒枠1の軸1eと同軸上に配置され、孔3aを中心として図2において反時計方向に回転付勢している（バリアを閉じ方向に付勢する）バネ7の一端を掛けけるための軸3cがバリア3に植設され、バネ7の他端は鏡筒枠1の軸1iに掛けられている。すなわち、バリア3はバネ7により軸3bをカム孔6gに形成されるカム面6fに当接させ、バリア駆動リング6に連動させている。

【0030】バリア駆動リング6は、鏡筒枠1の内周に光軸を中心として回動可能に嵌合し、鏡筒枠1の光軸方向に移動に連動して回動し、バリア2およびバリア3を駆動させるもので、バリア2及び3の前方に配置された鏡筒枠1の凸部1f及び1gに支持されている。

【0031】バリア駆動リング6には、図2、図4、図5に示すように、バリア2およびバリア3と共に共動してバリアカバー8の開口部8aの一部（対角方向）を開閉するための開閉手段としての斜線で示す開閉部6b及び6cが一体で形成されている。また、バリア駆動リング6には、鏡筒枠1の撮影開口部1bよりも大きな開口部6aと、バリア2の軸2bが当接する連結部としてのカム面6dを有するカム孔6eと、バリア3の軸3bが当接する連結部としてのカム面6fを有するカム孔6gと、バリア駆動リング6を図2において時計方向に回転付勢している（バリアを開き方向に付勢する）バネ7の一端を掛けけるためのフック6hが形成されており、バネ7の他端は鏡筒枠1の軸1jに掛けられている。

【0032】さらに、バリア駆動リング6の外周部には軸線方向（光軸に沿って鏡筒後方側へ）に延出するフォロワーアーム6iが形成されており、フォロワーアーム6iは鏡筒枠1の孔1cを貫通し、シャッター及び駆動部を有する地板10の前端側外周面に形成されたカム面10a（図3、図9参照）に当接するようになっている。

【0033】従って、鏡筒枠1が光軸に沿って後方に移動すると、フォロワーアーム6iは地板10のカム面10aに沿って滑る。その結果、カム面10aから受ける反力によりバリア駆動リング6が光軸を中心として図6において反時計方向に回転され、バリア2及び3がバリア駆動リング6により閉じ方向に駆動されるようになっている。

【0034】以上に示す本実施の形態において、バリアカバー8の開口部8aと、バリア駆動リング6の開口部6aと、バリア駆動リング6の開閉部6b、6cと、バリア2、3との夫々の位置関係は、図2に示すバリア全閉状態において、2点鎖線で示す4辺が全体に湾曲しているバリアカバー8の開口部8aに対し、バリア駆動リング6の開口部6aは斜めに傾斜した状態でバリア全閉位置に保持され、また一対のバリア2と3はバリアカバー8の開口部8aの対角位置にある角部に隙間を有する

ようにバリア全閉位置に保持されている。そして、バリア駆動リング6の開口部6aの周部に設けられている開閉部6b、6cがこの対角位置にある角部の隙間を塞ぐように位置する。したがって、バリアカバー8の開口部8aは、バリア2、3と、バリア駆動リング6の開閉部6b、6cにより塞がれることとなる。

【0035】このバリア駆動リング6の開口部6aがバリアカバー8の開口部8aに対して反時計方向に位相をずらした（傾斜状態）バリア全閉状態から、該開口部6aを該開口部8aに対して同位相となるまでバリア駆動リング6を時計方向に回動させると、当然にバリア駆動リング6の開閉部6b、6cは該開口部8a内から退避し、バリア2、3は開口部6aおよび開口部8a内から退避することになり、バリアカバー8の開口部8aは全開状態となる。

【0036】以下に上記した本実施の形態の構成の動作を簡単に説明する。

【0037】図2から図5に示すバリアが閉じた状態からバリアを開く場合、カメラのメインスイッチをONにすると、不図示のモーターを有する鏡筒駆動機構によって、不図示のカメラ本体内に沈胴していた鏡筒枠1が、図3の沈胴位置からカメラ前方（図3では上方）へ向かって繰り出され、鏡筒枠1と一緒に前進していくバリア駆動リング6のフォロワーアーム6iは地板10の前端側のカム面10aから離れる。

【0038】そして、バネ7の付勢力に抗して全閉位置に保持されていた駆動リング6は、バネ7のバネ力により、図2において時計方向（バリア開き方向）に回動され、バリア駆動リング6の開閉部6b及び6cとカム孔6e及び6gとフック6hも図2の位置から時計方向に移動してゆく。

【0039】このため、バリア駆動リング6の開閉部6b及び6cはバリアカバー8の開口部8aの外側に退避すると共に、バリア2の軸2bはバリア駆動リング6のカム孔6eのカム面6dに沿って移動するため、バリア2は孔2aを中心として時計方向（バリア開き方向）に回動され、バリアカバー8の開口部8aの外側に退避する。

【0040】このとき、バリア2の回動に連動してバネ4が孔2aを中心として時計方向に回動されチャージされる。また、同時にバリア3の軸3bはバリア駆動リング6のカム孔6gのカム面6fに沿って移動するため、バリア3は孔3aを中心として時計方向（バリア開き方向）に回動され、バリアカバー8の開口部8aの外側に退避する。このとき、バリア3の回動に連動してバネ7が孔3aを中心として時計方向に回動されチャージされる。そして、バリア駆動リング6の開閉部6b及び6cと、バリア2及び3が開いた後はバネ7により図6から図8に示すようにバリア開き状態が保持される。

【0041】一方、図6から図8に示すバリアが開いた

状態からバリアを閉じる場合、カメラのメインスイッチをOFFすると、不図示のモーターを有する鏡筒駆動機構によって図7の位置からカメラ本体の沈胴位置へ向かって鏡筒枠1が繰り込まれると、鏡筒枠1と一体に後進していくバリア駆動リング6のフォロワーアーム6iが地板10の前端側のカム面10aに当接した後にカム面10aに沿って滑り、カム面10aからの反力によってフォロワーアーム6iを介してバリア駆動リング6はバネ7をチャージしながら図6において反時計方向（バリア閉じ方向）に回動され、バリア駆動リング6の開閉部6b及び6cとカム孔6e及び6gとフック6hも図6の位置から反時計方向に移動してゆく。

【0042】このため、バリア駆動リング6の開閉部6b及び6cはバリアカバー8の開口部8aの内側に進入し開口部8aの一部（対角方向）を閉じると共に、バリア2の軸2bはバリア駆動リング6のカム孔6eのカム面6dに沿って移動するため、バネ4により、バリア2は孔2aを中心として反時計方向（バリア閉じ方向）に回動され、バリアカバー8の開口部8aの内側に進入する。

【0043】また、同時にバリア3は軸3bがバリア駆動リング6のカム孔6gのカム面6fに沿って移動するため、バネ5によりバリア3の孔3aを中心として反時計方向（バリア閉じ方向）に回動され、バリアカバー8の開口部8aの内側に進入する。そして、バリア駆動リング6の開閉部6b及び6cが閉じた後は地板10のカム面10aにより、バリア2及び3が閉じた後はバネ4及び5のバネ力により図1から図5に示すようにバリア閉じ状態が保持される。

【0044】本実施の形態においては、バリア駆動リング6に開閉手段としての斜線で示す開閉部6b及び6cを設けたので、バリアの枚数を増やすことなくバリアカバー8の開口部8aの一部（対角方向）を開閉することができる。また、バリア装置の全長を長くする必要がなく、レンズ鏡筒の小型化を図ることができる。

【0045】【第2の実施の形態】図10から図13は本発明の第2の実施の形態を示したものである。

【0046】本実施の形態における機械的構造は第1の実施の形態のものとほぼ同じであるから、第1実施の形態に示した構造要素と同じものは図10から図13においても図1から図9と同じ符号で表示し、これらの構造要素については説明を省略する。また、第2の実施の形態の機構の動作も第1の実施の形態と同じなので説明を省略する。

【0047】図10はバリア装置の構成を示す分解斜視図、図11はバリアが全閉した状態を示す正面図、図12は図11のD-D矢視断面図、図13は図11のE-E矢視断面図である。

【0048】本第2の実施の形態で第1の実施の形態と異なるのは、バリアカバー8の開口部8aの一部を開閉

する開閉部材21を新たに設けたことである。

【0049】本実施の形態における開閉部材21には、鏡筒枠1の撮影開口部1bより大きな開口部21aと、バリアカバー8の開口部8aの一部（対角方向）を開閉するための開閉手段としての斜線で示す開閉部21b及び21cと、バリア2及び3のアオリを防止する凸部21dが開口部21aの全周に形成され、軸21e及び21fが植設されている。

【0050】開閉部材21はバリア駆動リング6の開口部6aに嵌合し、軸21eがバリア駆動リング6の孔6jと、軸21fがバリア駆動リング6の孔6kと嵌合しているため、バリア駆動リング6と一体で回動する。

【0051】本実施の形態においては、開閉部21b及び21c（斜線部）を有する開閉部材21を設けてバリアカバー8の開口部8aの一部（対角方向）を開閉するので、バリアの枚数を増やすことなくバリアカバー8の開口部8aを閉じることができると共に、レンズ鏡筒の小型化（特に外径）を図ることができる。また、開閉部材21に凸部21dを設けたのでバリア2及び3の開閉途中のアオリ及び、全閉したときにバリア2及び3を段差なく合わせることができる。

【0052】更に、バリア2及び3と開閉部材21との隙間を狭くすることができるので、ゴミ等の侵入する確率が少なくなると共に、ゴミ等がバリア2及び3と凸部21dとの隙間に侵入してもバリア2及び3と開閉部材21は互いに回動するため、侵入したゴミ等が除去され、バリア2及び3の動作に支障を来す虞がない。

【0053】【第3の実施の形態】図14および図15は本発明の第3の実施の形態を示したものである。

【0054】本実施の形態における機械的構造は第1の実施の形態のものとほぼ同じであるから、第1実施の形態に示した構造要素と同じものは図14及び図15においても図1から図9と同じ符号を表示する。

【0055】図14はユニットで構成されるバリア装置を示す分解斜視図、図15はバリア装置ユニットと鏡筒枠を示す斜視図である。

【0056】図14及び図15において、1は光軸方向に移動可能に配置されている鏡筒枠で、鏡筒枠1の内部の後方には図3及び図7に示すレンズ保持筒9（撮影光学系）と、前方には後述するバリア装置ユニット30が連結され、レンズ保持筒9とバリア装置ユニット30は鏡筒枠1が光軸方向に移動するとき、鏡筒枠1と一体になって光軸方向に移動する。鏡筒枠1の前端部から後方へ入り込んだ位置に前端板1aが形成され、前端板1aの中心には開口部1bと、バリア駆動リング6のフォロワーアーム6iが貫通する孔1cと、光学調整するための孔1kが形成されている。

【0057】31は新たに設けられたバリア装置ユニット30を構成するバリア地板で、前端部から後方へ入り込んだ位置に前端板31aが形成され、前端部31aの

中心にはレンズ保持筒9の撮影光学系に対する撮影開口部31b形成され、撮影開口部31bの周辺にはバリア駆動リング6のフォローアーム6iが貫通する孔31cが形成され、バリア2及び3を回動可能に支持する軸31d及び31eと、バリア駆動リングを光軸方向に支持する凸部31f及び31gと、バネ4及び5の一端を掛ける軸31h(不図示)及び31iと、バネ7の一端を掛ける軸31jが光軸と平行に植設されている。

【0058】バリア地板31の前端部には撮影開口部31bより大きな開口部8aを有したバリアカバー8が配置され前端板31aとバリアカバー8との間に後述するバリア2及び3と、バリア駆動リング6と、バネ4及び5及び7を配置することで、バリア装置ユニット30が構成されている。

【0059】一对のバリア2及び3はバリアカバー8の後方に配置され、光軸方向とほぼ直交する平面上内において回動してバリアカバー8の開口部8aを開閉するようになっており、後述するバリア駆動リング6により駆動される。

【0060】バリア2は、基端部に形成された孔2aがバリア地板31の軸31dに回動可能に嵌合支持され、バリア3は、同じく基端部に形成された孔3aがバリア地板31の軸31eに回動可能に嵌合支持されている。

【0061】バリア2の孔2aの近傍位置にはバリア駆動リング6により駆動される軸2bが植設され軸2bはバリア駆動リング6に形成されたカム孔6e内に配置されている。

【0062】また、バリア地板31の軸31dと同軸上に配置され、孔2aを中心として図14において反時計方向に回転付勢している(バリアを閉じ方向に付勢する)バネ4の一端を掛けるための軸2cがバリア2に植設されており、バネ4の他端はバリア地板31の軸31hに掛けられている。すなわち、バリア2はバネ4により軸2bをカム孔6eに形成されるカム面6dに当接させ、バリア駆動リング6に連動させている。

【0063】同様に、バリア3の孔3aの近傍位置にはバリア駆動リング6により駆動される軸3bが植設され、軸3bはバリア駆動リング6に形成されたカム孔6g内に配置されている。

【0064】また、バリア地板31の軸31eと同軸上に配置され、孔3aを中心として図2において反時計方向に回転付勢している(バリアを閉じ方向に付勢する)バネ5の一端を掛けるための軸3cがバリア3に植設されており、バネ5の他端はバリア地板31の軸31iに掛けられている。

【0065】すなわち、バリア3はバネ5により軸3bをカム孔6gに形成されるカム面6fに当接させ、バリア駆動リング6に連動させている。

【0066】バリア駆動リング6はバリア地板31の周に光軸を中心として回動可能に嵌合し、鏡筒枠1の光

軸方向に移動に連動して回動し、バリア2及び3を駆動させるもので、バリア2及び3の前方に配置されバリア地板31の凸部31f及び31gに支持されている。

【0067】バリア駆動リング6には、図14に示すように、バリア2及び3と同様にバリアカバー8の開口部8aの一部(対角方向)を開閉する開閉手段としての斜線で示す開閉部6b及び6cが一体で形成され、バリア地板31の撮影開口部31bよりも大きな開口部6aと、バリア2の軸2bが当接する連結部としてのカム面6dを有するカム孔6eと、バリア3の軸3bが当接する連結部としてのカム面6fを有するカム孔6gと、バリア駆動リング6を図14において時計方向に回転付勢している(バリアを開き方向に付勢する)バネ7の一端を掛けるためのフック6hが形成されており、バネ7の他端はバリア地板31の軸31jに掛けられている。

【0068】さらに、バリア駆動リング6の外周部には軸線方向(光軸に沿って鏡筒後方側へ)に延出するフォローアーム6iが形成されており、フォローアーム6iはバリア地板31の孔31c及び鏡筒枠1の孔1cを貫通し、シャッター及び駆動部を有する地板10の前端側外周面に形成されたカム面10a(図9参照)に当接するようになっている。従って、鏡筒枠1が光軸に沿って後方移動するとフォローアーム6iは地板10のカム面10aに沿って滑る。その結果、カム面10aから受ける反力によりバリア駆動リング6が光軸を中心として図14において反時計方向に回転され、バリア2及び3がバリア駆動リング6により閉じ方向に駆動されるようになっている。

【0069】以下に上記構成の動作を簡単に説明する。

【0070】バリアが閉じた状態からバリアを開く場合、カメラのメインスイッチをONすることにより、不図示のモーターを有する鏡筒駆動機構によって、第1の実施の形態における図3と同様に、カメラ本体の沈胴位置からカメラ本体の前方へ向かって鏡筒枠1が繰り出される。

【0071】そして、鏡筒枠1と一体に前進していくバリア駆動ユニット30内に配置されているバリア駆動リング6のフォローアーム6iは地板10の前端側のカム面10aから離れ、バネ7によりバリア駆動リング6が図14において時計方向(バリア開き方向)に回動され、バリア駆動リング6の開閉部6b及び6cとカム孔6e及び6gとフック6hも図14の位置から時計方向に移動してゆく。

【0072】このため、バリア駆動リング6の開閉部6b及び6cはバリアカバー8の開口部8aの外側に退避すると共に、バリア2の軸2bはバリア駆動リング6のカム孔6eのカム面6dに沿って移動するため、バリア2は孔2aを中心として時計方向(バリア開き方向)に回動され、バリアカバー8の開口部8aの外側に退避する。このとき、バリア2の回動に連動してバネ4が孔2

aを中心として時計方向に回動されチャージされる。
【0073】また、同時にバリア3の軸3bはバリア駆動リング6のカム孔6gのカム面6fに沿って移動するため、バリア3は孔3aを中心として時計方向（バリア開き方向）に回動され、バリアカバー8の開口部8aの外側に退避する。このとき、バリア3の回動に連動してバネ5が孔3aを中心として時計方向に回動されチャージされる。そして、バリア駆動リング6の開閉部6b及び6cと、バリア2及び3が開いた後はバネ7によりバリア開き状態が保持される。

【0074】一方、バリアが開いた状態からバリアを閉じる場合、メインスイッチをOFFにすることにより、第1の実施の形態における図7と同様に、不図示のモーターを有する鏡筒駆動機構によって撮影位置から沈胴位置に繰り込まれていると、鏡筒枠1と一緒に後進していくバリア装置ユニット内に配置されたバリア駆動リング6のフォローアーム6iが地板10の前端側のカム面10aに当接した後にカム面10aに沿って滑り、カム面10aからの反力によってフォローアーム6iを介してバリア駆動リング6はバネ7をチャージしながら図14において反時計方向（バリア閉じ方向）に回動され、バリア駆動リング6の開閉部6b及び6cとカム孔6e及び6gとフック6hも図14の位置から反時計方向に移動していく。

【0075】このため、バリア駆動リング6の開閉部6b及び6cはバリアカバー8の開口部8aの内側に進入し開口部8aの一部（対角方向）を閉じると共に、バリア2の軸2bはバリア駆動リング6のカム孔6eのカム面6dに沿って移動するため、バネ4によりバリア2は孔2aを中心として反時計方向（バリア閉じ方向）に回動され、バリアカバー8の開口部8aの内側に進入する。

【0076】また、同時にバリア3は軸3bがバリア駆動リング6のカム孔6gのカム面6fに沿って移動するため、バネ5によりバリア3の孔3aを中心として反時計方向（バリア閉じ方向）に回動され、バリアカバー8の開口部8aの内側に進入する。

【0077】そして、バリア駆動リング6の開閉部6b及び6cが閉じた後は地板10のカム面10aにより、バリア2及び3が閉じた後はバネ4及び5のバネ力により図15に示すようにバリア閉じ状態が保持される。

【0078】上記した第3の実施の形態においては、ユニットで構成されるバリア装置であって、バリア駆動リング6に開閉部6b及び6cを設けたので、バリアの枚数を増やすことなくバリアカバー8の開口部8aの一部（対角方向）を開閉することができる。また、バリア装置ユニットの全長を長くする必要がなく、レンズ鏡筒の小型化を図ることができる。

【0079】（発明と実施の形態の対応）以上の実施の形態において、鏡筒枠1は本発明の鏡筒部材に相当し、

バリア開口部8aを有するバリアカバー8が本発明のバリア開口部を有するバリアカバーに相当し、バリア2、3が本発明の一対のバリアに相当し、開閉部6b、6cが本発明の開閉手段に相当し、バリア駆動リング6が本発明の回動部材に相当し、バリア駆動リング6、とカム面6d、6fと、フォローアーム6i、とカム面10aを有する地板10がバリア駆動手段に相当する。また、フォローアーム6i、とカム面10aを有する地板10が本発明の連結手段に相当する。さらに、凸部21dが当接部材に相当する。

【0080】なお、以上が本発明の各構成と実施の形態の各構成の対応関係であるが、本発明は、これら実施形態の構成に限られるものではなく、請求項で示した機能、または実施の形態の構成が持つ機能が達成できる構成であればどのようなものであっても良いことは言うまでもない。

【0081】また、本発明は、一眼レフカメラ、レンズシャッタカメラ、ビデオカメラ等種々の形態のカメラ、さらにはカメラ以外の光学機器やその他の装置、さらにはそれらのカメラや光学機器やその他の装置、さらにはそれらカメラや光学機器やその他の装置に適用される装置または、これらを構成する要素に対しても適用できる。

【0082】また、本発明は、特許請求の範囲または実施の形態の構成の全体若しくは一部が、一つの装置を形成するようなものであって、他の装置との結合するようなものであってもよく、装置を構成する要素のようなものであってもよい。

【0083】

【発明の効果】請求項1～7に係る発明によれば、バリアの枚数を増やすことなく前記バリアカバーの開口部を開閉することができる。また、バリア装置の全長を長くすることなく構成できると共に、レンズ鏡筒の小型化を図ることができる。

【0084】また、バリアの開閉途中のアオリ及び、全閉したときバリアを段差なく合わせることができる。更に、前記バリアと前記開閉部材との隙間を狭くすることができるので、ゴミ等の侵入する確率が少なくなると共に、ゴミ等がバリアと前記凸部との隙間に侵入してもバリアと開閉部材は互いに回動するため、侵入したゴミ等が除去され、バリアの動作に支障を来す虞がない。

【図面の簡単な説明】

【図1】本発明の第1の実施の形態におけるバリア装置の分解斜視図。

【図2】本発明の第1の実施の形態でバリアが全閉した状態で、バリアカバーの撮影開口部のみを示した正面図。

【図3】本発明の第1の実施の形態で図2のA-A矢視断面図で、バリアカバーが設けられている状態の図。

【図4】本発明の第1の実施の形態で図2のB-B矢視

断面図で、バリア駆動リングがバリアカバーの一部を閉じた状態図。

【図5】本発明の第1の実施の形態でバリアが全閉した状態を示す斜視図。

【図6】本発明の第1の実施の形態でバリアが全開した状態で、バリアカバーの撮影開口部のみを示した正面図。

【図7】本発明の第1の実施の形態で図6のC-C矢視断面図で、バリアカバーが設けられている状態の図。

【図8】本発明の第1の実施の形態でバリアが全開した状態で、バリアカバーの撮影開口部のみを示した斜視図。

【図9】本発明の第1の実施の形態で地板のカム面とバリア駆動リングのフォロワーアームとの関係を示す概略図。

【図10】本発明の第2の実施の形態でバリア装置の分解斜視図。

【図11】本発明の第2の実施の形態でバリアが全閉した状態で、バリアカバーの撮影開口部のみを示した正面図。

【図12】本発明の第2の実施の形態で図11のD-D矢視断面図で、バリアカバーが設けられている状態の図。

【図13】本発明の第2の実施の形態で図11のE-E矢視断面図で、バリア駆動リングがバリアカバーの一部を閉じた状態図。

【図14】本発明の第3の実施の形態でユニット構成されるバリア装置を示す分解斜視図。

【図15】本発明の第3の実施の形態でバリア装置ユニットと鏡筒枠を示す斜視図。

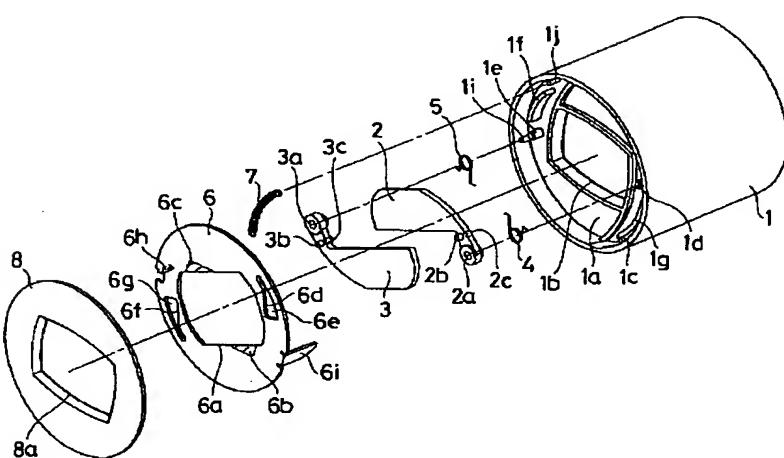
【図16】従来のカメラのバリア装置のバリアが全閉した状態で、バリア駆動リング及びバリアカバーを除去した正面図。

【図17】従来のカメラのバリア装置のバリアが全開した状態で、バリア駆動リング及びバリアカバーを除去した正面図。

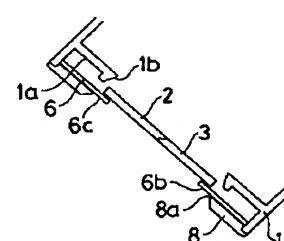
【符号の説明】

- 1, 101…鏡筒枠
- 1a, 31a…前端板
- 1b, 31b…撮影開口部
- 1c, 2a, 3a, 6j, 6k, 31c…孔
- 1d, 1e, 1h, 1i, 1j…軸
- 2b, 2c, 3b, 3c, 21e, 21f, 31d, 31e, 31h, 31i, 31j, 1f, 1g, 21d, 31f, 31g…凸部
- 2, 3, 102, 103…バリア
- 4, 5, 7…バネ
- 6…バリア駆動リング
- 6a, 8a, 21a, 108a…開口部
- 6b, 6c, 21b, 21c…開閉部
- 6d, 6f, 10a…カム面
- 6e, 6g…カム孔
- 6h…フック
- 6i…フォロワーアーム
- 8, 108…バリアカバー
- 9…レンズ保持筒
- 10…地板 21…開閉部材
- 30…バリア装置ユニット
- 31…バリア地板

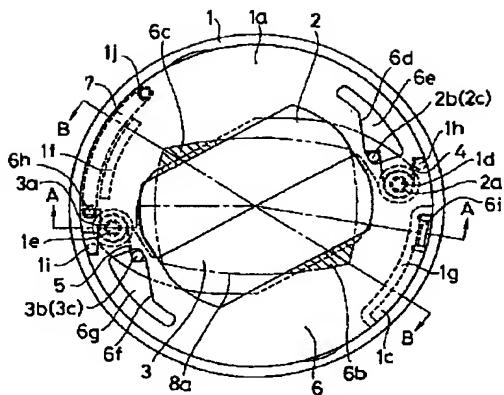
【図1】



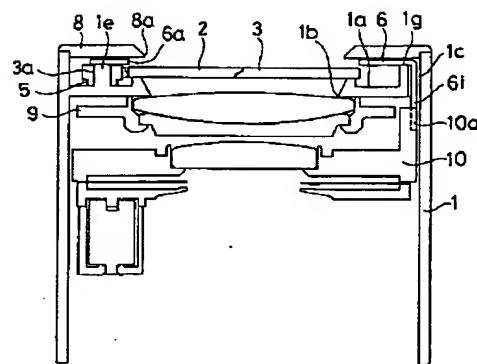
【図4】



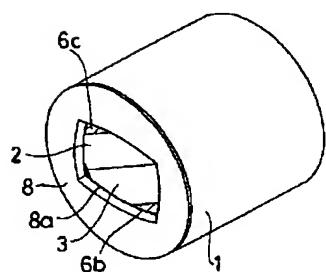
【図2】



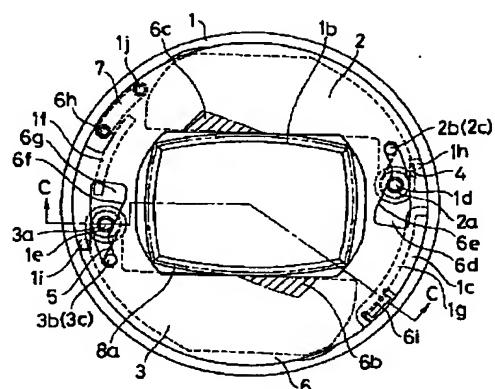
【図3】



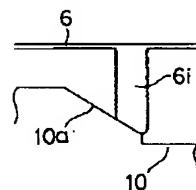
【図5】



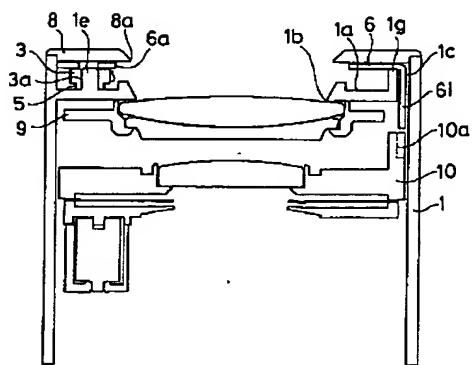
【図6】



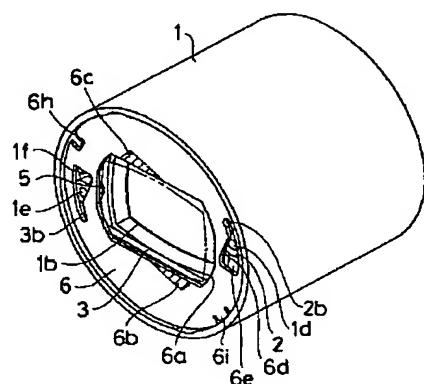
【図9】



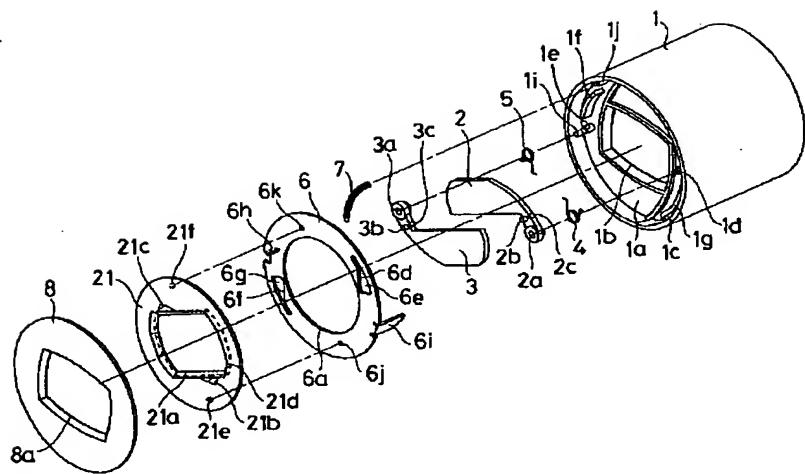
【図7】



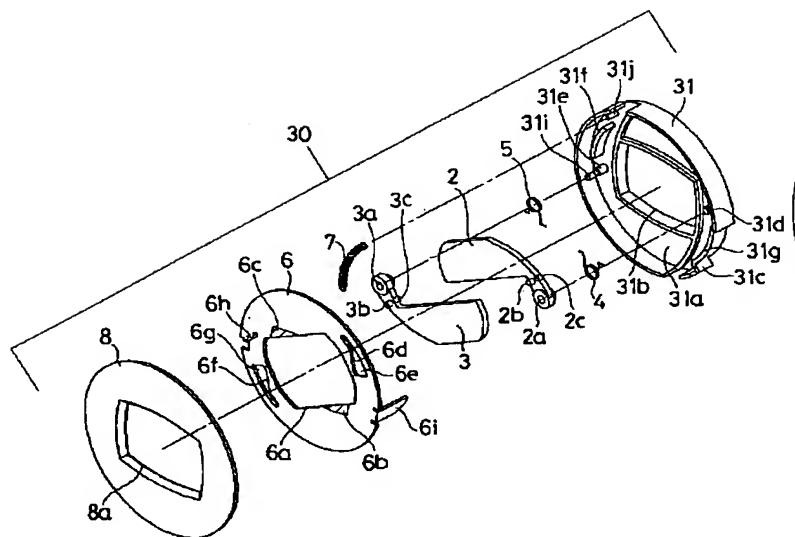
【図8】



【図10】



【图14】



【図17】

